Oral Reading Fluency

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cercs for enterprise transformation and innovation

Introduction

Facts

- Reading is the most essential skill for success in school.
- 20% of all elementary children experience difficulty leaning to read.
- 80% of children with learning disabilities experience problems in learning to read.
- Urban setting has a large student to teacher ratio making individualized instruction challenging.

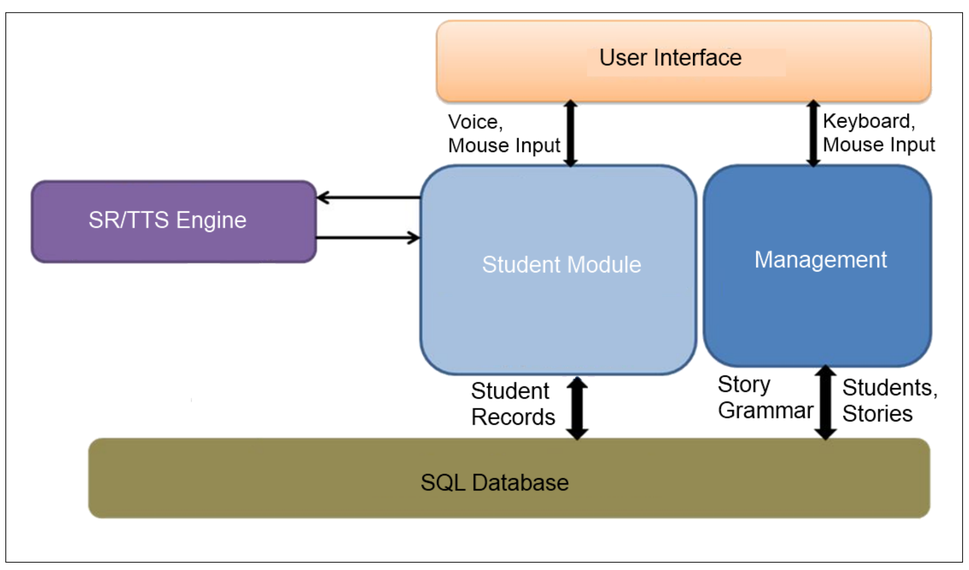
Problem

- Developing real time ASR systems for children presents unique challenges:
  - Most ASR systems are trained with adult speakers.
  - Children's vocal tracks differ significantly from adults.
  - Children's speech includes malformed phonemes and other speech challenges.
- HCI requirements for children and beginning readers differ from adult requirements.

Research Aims

- What utility will repeated reading strategies, consisting of CR passages delivered through interactive computer software have on the development of an effective ORF curriculum for 1st and 2nd grader urban learners?
- To what extent will target students demonstrate improvement in reading growth rate in ORG using this intervention?
- Decoding failure states through meaningful presentation of instrumentation data: Case study in presentation of instrumentation data to expedite understanding of complex software state transitions.
- Affect of introduction on student attitude and utilization of instructional software.

System Architecture



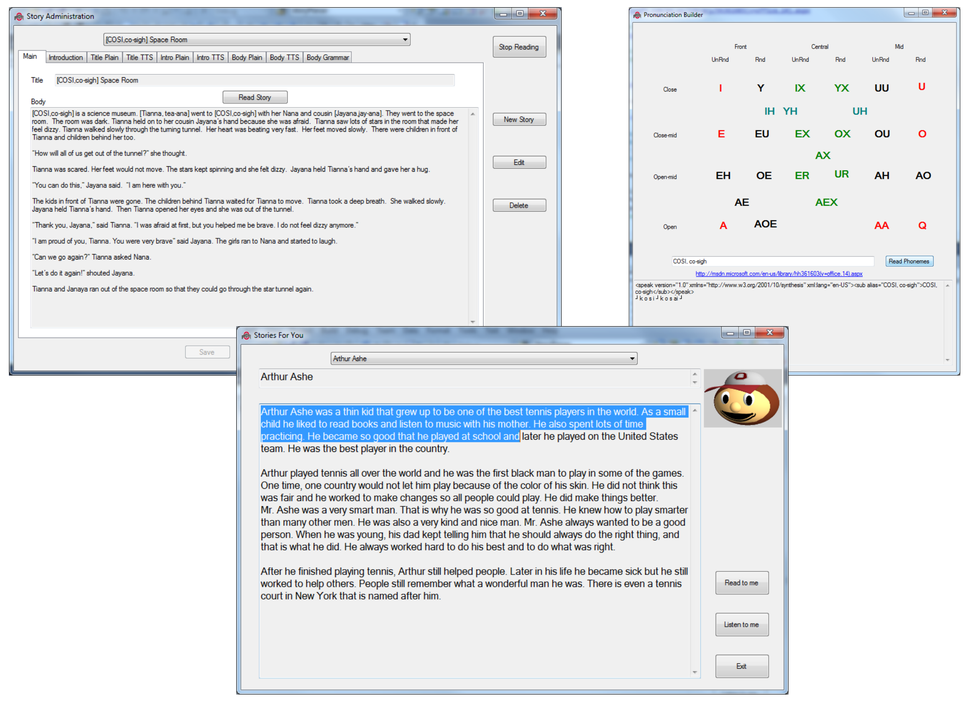
Components

- Visual Studio 2010 C#
- MySQL Database
- Logitech ClearChat Comfort USB Headset
- Microsoft Speech Recognition Engine 11.0
- .NET Framework 4.5 System Speech Synthesis

Software

Initial Features

- Add/Edit/Delete stories with phonetic markup.
- Read story through TTS.
- Real-time ASR to assist the student in reading the story.
- Track insertions, deletions and reading errors as the child reads.
- Highlight the words as the child reads the story.
- Automatically conduct timed readings of the student.
- Record student student's results from each attempt.



Significance

- Assist students in a high student-to-teacher ratio urban classroom.
- Provides quantitative data on the each students progress towards reading fluency.
- Quantifies the capability of computer assisted learning pertaining to
  - Urban students, first and second graders , reading skills acquisition.
- Quantifies the ability to develop CR stories using continuous feedback and results from students and the stories impact on fluency.
- Provide instrumentation tool to facilitate instrumentation of complex software.
- Analyze HCI impact on student acceptance and utilization of instructional systems.

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Acknowledgements

A special thanks to Dr. Rajiv Ramnath, Dr. Gwendolyn Cartledge and Dr. Eric Fosler-Lussier for their guidance, insight and support on this project.

This work is funded through an grant provided by the Institute of Education Sciences